

REMARKS

Claims 1 through 19 are pending in the application.

Double Patenting

The examiner states that claim 1 of the instant application conflicts with claim 1 of U.S. 6,563,083 and points out that 37 CFR 1.78(b) provides that when two or more applications filed by the same applicant contain conflicting claims, elimination of such claim from all but one application may be required. Examiner requests that applicant cancel the conflicting claim or maintain a clear line of demarcation.

It is respectfully submitted that 37 CFR 1.78(b) and MPEP 822 both relate to **applications** containing claims to inventions that are not distinct. Note the language of 37 CFR 1.78 (b): "Where **two or more applications** contain conflicting claims". Note the language of the heading of MPEP 822: "Claims to inventions that are not distinct in **plural applications** ...". In the present situation, a patent has already issued so that there are no longer pending applications. The legal standards applied by the examiner are incorrect.

Claim 1 is further objected to under 37 CFR 1.75 as being substantially a duplicate of another. The examiner states that when two claims of an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. The Examiner refers to MPEP § 706.03(k).

It is respectfully submitted that 37th CFR 1.75 and MPEP § 706.03(k) concern claims in **one and the same application**. Examiner has not pointed out which one of the claims in the instant application appears to be a duplicate of claim 1. Should the Examiner refer to the Issued patent U.S. 6,563,083, the legal standard that examiner attempts to apply here is clearly incorrect.

A double patenting rejection of claim 1 of the instant application in view of the already issued patent U.S. 6,563,083 is possible only in view of 35 USC §102 or the judicially created doctrine of obviousness-type double patenting. See MPEP 804. Neither one of these standards has been applied by the examiner.

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Applicant however would like to point out that the issued patent relates to a laser robot, i.e., a device for machining workpieces, while the instant application relates to laserbeam optics, an optical device for guiding a laser beam. It is not understood how a claim directed to a robot could conflict with a claim directed to laser beam optics.

Claim Rejections - 35 U.S.C. 112

Claims 1-19 stand rejected under 35 U.S.C. 112, 2nd paragraph, as being indefinite, vague, and confusing for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The examiner points out that claim 1 recites:

wherein the first beam path (12) is configured to be deflected at an end facing a workpiece into an axis-parallel second beam path (14), and wherein a third beam path (15) of a second working laser beam (16) is arranged axis-parallel to the first beam path (12) of the first working laser beam (13)

and

first and second optical elements arranged successively in one of the first and second beam paths (12 or 14) of the first working laser beam (13) and configured to be transmissive to the first working laser beam (13) in a transmission direction toward a workpiece, wherein the two optical elements are adjusted relative to one another so as to compensate laser beam displacement (17) of the first working laser beam (13).

The examiner states that it is vague and indefinite as to whether the second beam is parallel to the first beam, before or after the beam has been deflected at an end facing.

It is respectfully submitted that the wording is very clear:

the first beam path (12) is configured to be deflected [at an end facing a workpiece] into an axis-parallel second beam path (14)

The phrase in brackets designates the location where the deflection of the first beam path takes place; when disregarding the phrase in brackets, it is clearly stated that **the first beam path is deflected into the second beam path**. Therefore, it is clear, and there cannot be any other interpretation of this claim language, that the first beam path is deflected at the end that is facing the workpiece to continue as the second beam path.

The examiner states that it is also vague and indefinite "as to the first and second optical elements *arranged successively in the first or second beam path so that the beam will travel through the elements independently*, or the optical elements are arranged so that both laser beams will travel through the optical elements".

The Examiner's objection is not understood. Only the **first laser beam 13** travels on the first and second beam path (the claim reads: *the first and second beam paths of the first laser beam*). So, there is only one beam traveling through the optical elements, no matter whether they are located on the first beam path or on the second beam path. Examiner's attention is directed to Fig. 2 where the course of the two beam paths 12 and 14 is illustrated. The laser beam 13 travels from the laser radiation inlet 48 long beam path 12, is deflected, and continues on beam path 14.

The Examiner further points out that there are no means to generate a laser beam nor structure and functional relationship to conform laser beam optics. The claims are therefore vague and indefinite in Examiner's opinion.

It is respectfully submitted that an optical device, i.e., a system comprised, for example, of lenses, mirrors, or light guides, does not require a means for generating radiation that is to be guided by the system. Binoculars are an optical device as are spectacles or a telescope. These device are designed to receive and guide external beams or radiation - they themselves do not have means for generating radiation. The present invention is directed to an optical system that is used in connection with lasers and robots but the optical system itself does not contain a laser-generating device.

Therefore, the language of claim 1 clearly sets forth the device of the present invention and provides all necessary structural elements.

Rejection under 35 U.S.C. 102

Claims 1-3, 8-13, 15-19 stand rejected under 35 U.S.C. 102(b) as being anticipated by *Hohberg* (US 4,707,596) or *Muller et al.* (US 4,659,916).

Hohberg discloses a first laser 1 whose working beam is directed to the focusing lens 21 through an articulated arm. A pilot laser 2 emits a beam that is coupled by means of the beam splitter 10 into the articulated arm so that the pilot beam is coaxial to the beam of the first laser. The pilot laser 2 is used to indicate the position of the laser on the

workpiece. From the beam splitter 10, the two laser beams travel along the same path coaxially to one another within the articulated arm, are first reflected at the adjusting mirror 11, then at the mirrors 17 and 18, and finally on mirror 19 that is also a beam splitter that reflects the working laser beam 1 onto the focusing lens 21 while permitting unreflected passage of a component beam of the pilot laser onto the triple mirror 200. The triple mirror reflects the incident component beam of the pilot laser back into itself. The beam is thus reflected in the opposite direction onto the semi-transparent mirror 8 where it strikes the detector 201. When the component beam begins to wander due to mechanical deviations within the articulated arm etc., the component beam reflected on the triple mirror 200 will be parallel-displaced relative to the incident pilot beam, and this displacement is detected by the detector 201. The displacement of the beam detected by detector 201 provides a signal by means of the electronic circuit 13 that adjusts the adjusting mirror 11 that is mounted within the beam path of lasers 1 and 2 in the articulated arm. By means of the adjusting mirror 11, the laser beams 1, 2 are again properly centered and focused.

Claim 1 of the present invention defines the following features:

- a) first and second optical elements that are arranged successively in one of the first and second beam paths (12 or 14) of the first working laser beam (13);
- b) the first and second optical elements are transmissive to the first working laser beam (13) in a transmission direction toward a workpiece;
- c) the two optical elements are adjusted relative to one another so as to compensate laser beam displacement (17) of the first working laser beam (13).

The feature "optical elements transmissive to the first working laser beam in a transmission direction toward a workpiece" is fulfilled only by the beam splitter 10 of *Hohberg*. All other optical elements 11, 17, 18 on the beam path in the **transmission direction toward the workpiece** of the laser beams 1 and 2 are **deflection mirrors** that deflect the laser beams 1 and 2 but do not allow them to pass through, i.e., they are not transmissive. Mirror 19 is semi-transparent only for laser beam 2 allowing passage in a direction away from the workpiece. Therefore feature b) is not anticipated or obvious.

Feature c) is also not anticipated or obvious because there is only one optical element, the adjusting mirror 11, that is used to compensate laser beam displacement.

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However, the mirror 11 is a deflecting mirror and it is not transmissive for the laser beam in the transmission direction toward the workpiece.

The cited prior art *Hohberg* therefore cannot anticipate or make obvious the invention as claimed in claim 1 and its dependent claims.

Müller et al. discloses essentially the same arrangement as *Hohberg* with the exception that the mirror 8 is now adjustable and includes a piezoelectric bending element 9 that is periodically energized by generator 7 and modulates the beam of the pilot (auxiliary) laser 2. The periodic modulation of the beam direction of pilot laser 2 causes the detector 20 to supply a dc signal as well as an ac signal. From the amplitude relationship and phase position of this signal with reference to the output of generator 7, the rotational position of mirror 11 relative to detector 20 can be determined by electronic circuit 13. Based on the corrective positioning signal generated for mirror 11 by circuit 13, the mirror 11 can be adjusted by magnitude and direction such that the component beam of laser 2 passing through beam splitter 19 impinges centrally upon detector 20.

The basic configuration within the beam paths of the two laser beams in *Hohberg* and *Müller et al.* is the same. The mirror 11 is still a deflecting mirror and no other optical element has been added to the beam path of the lasers. The only difference is the adjustability of mirror 8 for improving the compensation of deflection of the pilot beam.

The cited prior art *Müller et al.* therefore cannot anticipate or make obvious the invention as claimed in claim 1 and its dependent claims.

Rejection under 35 U.S.C. 103

Claims 4-6 and 14 stand rejected under 35 U.S.C. 103(a) as being unpatentable over *Hohberg* (US 4,707,596) oder *Müller et al.* (US 4,659,916) in view of *Inoue* (US 4,689,467).

Inoue is cited by the examiner to show the use of CO₂ lasers and Nd:YAG lasers as well as prisms in the beam path. However, the *Inoue* reference cannot contribute any teaching in regard to the configuration of optical elements as claimed in claim 1. Since claim 1 should be allowable for the reasons presented above, the dependent claims 4-6 and 14 should also be allowable.

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CONCLUSION

In view of the foregoing, it is submitted that this application is now in condition for allowance and such allowance is respectfully solicited.

Should the Examiner have any further objections or suggestions, the undersigned would appreciate a phone call or e-mail from the examiner to discuss appropriate amendments to place the application into condition for allowance.

Authorization is herewith given to charge any fees or any shortages in any fees required during prosecution of this application and not paid by other means to Patent and Trademark Office deposit account 50-1199.

Respectfully submitted on February 9, 2004,


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